The factors influencing urban health in Jakarta Province during Covid-19 outbreak

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The factors influencing urban health in Jakarta Province during Covid-19 outbreak

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Abstract. The rapid urbanization in Jakarta has given rise to a wide range of urban problems, characterized by an imbalance between the population growth rate and urban resources. This imbalance has resulted in a decline in the quality of urban services, making the population highly venerable to diseases, particularly during and after the Covid-19 outbreak. Relevant studies have indicated that variables related to infrastructure, social and economic determinants can affect urban health. However, the literature exploring the relationship between health determinants and urban health from an urban planning perspective is still limited. The aim of the research is to examine the relationship between health determinants and urban health in Jakarta Province during the Covid-19 outbreak. The study employed Partial Least Square (PLS) path modeling using smartPLS software, while data were collected through questionnaires administered to 317 Jakarta residents. The results showed that urban health determinants, represented by the built environment/infrastructure and social determinants, significantly and positively impacted the physical health of Jakarta residents. However, the urban health determinants insignificant on the mental health of Jakarta residents during Covid-19. It was also found that built environment/infrastructure had a greater influence on physical health than other determinants. This impact was significant for both neighborhoods that are well-resourced and under-resourced. The influence of the social determinant on physical health significantly varied between these neighborhoods. This research emphasized the importance of stakeholders focusing on improving the population's quality of life and health through the built environment/infrastructure and social determinants.

1. Introduction

High population density is a common occurrence in cities due to urbanization. The increase in urban population results in increased demand for urban services across various sectors. However, this creates an imbalance between the rate of population growth and urban resources, leading to a decline in the quality of urban services, such as limited and uneven accessibility to adequate infrastructure. According to the U.N., at least one-third of the global urban population faces inadequate living conditions, including high density, the spread of infectious diseases, and adverse environments that negatively impact the quality of life and health [1]. Covid-19 is one of the infectious/communicable diseases that has had a global impact, specifically in Indonesia. Jakarta Province has the highest population density in Indonesia [2], with a population of 10,562,088 people, a population growth rate of 0.92% per year, and a population density of 14,555 people/km² [3]. The increase in Covid-19 cases was also accompanied by a surge in cases in Jakarta Province, reaching its peak in July 2021 [4]. To combat the spread of Covid-19, a range of policies has been implemented since 2020, including Indonesia's large-

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scale social restrictions (LSSR), Transitional LSSR, the Community Activities Restrictions Enforcement (CARE), Java-Bali CARE, Micro-scale CARE, Emergency Public Activity Restriction, and the New Policy of CARE levels 1-4. Apart from infectious diseases, the World Health Organization (WHO) reports that 63% of global deaths are attributed to non-communicable diseases (NCDs) like cardiovascular diseases, cancer, and diabetes, most of which are linked to risks associated with urban physical and social environments [1]. In Indonesia, NCDs were the third leading cause of death in both men and women in 2017, with Ischemic Heart Disease, Stroke, and Diabetes Mellitus being the prominent diseases [5]. Mental health disorders were also prevalent among urban residents [5].

Urban health entails the examination of urban attributes, which include both social and physical environmental elements, as well as the availability of resources and infrastructure that can impact health and disease within urban settings [6]. The urban health framework for the Western Pacific region, spanning from 2016 to 2020, extends beyond the concept of "healthy cities" and underscores the significance of fostering "healthy and resilient cities." This approach takes a proactive stance toward promoting urban health [7]. The determinants of urban health require a multilevel examination. Systematic literature reviews highlighted the impact of variables related to the built environment, social and economic determinants on urban health [6,8-11]. Although urban planning has the potential to influence urban health studies, the relationship between the two fields is relatively new and gaining attention from urban planners and health experts. Besides, the existing literature exploring the relationship between the scope/determinants of health, such as the built environment/infrastructure, social, as well as economic factors, and urban health in Jakarta Province from a planning perspective, is still limited. Therefore, this study aims to examine the relationship between health determinants and urban health in Jakarta Province during the Covid-19 outbreak.

2. Methods

This research utilized a quantitative method to investigate how health determinants associated with the built environment/infrastructure, along with social and economic factors, influence the health status of residents in Jakarta. This section offers a summary of the data collection and analysis.

2.1. Data collection

The primary data were obtained through questionnaires that were distributed online and offline in August 2022 - October 2022. The survey consisted of questions regarding individuals' self-evaluations of their physical and mental health statuses amid the Covid-19 pandemic, which were addressed independently. Respondents assessed the statements presented in Table 1 using a Likert scale, where they could choose from the following options: "1 = Strongly Disagree," "2 = Disagree," "3 = Neutral," "4 = Agree," and "5 = Strongly Agree".

Table 1. Determining variables to build a model.

Determinants	Variables	Statements on the Questionnaires
Built environment/ infrastructure (Independent)	I1. Housing condition [6, 10]	The housing condition affects my health condition
	I2. Housing density [12]	The housing density (building area and number of occupants) affects my health condition
	I3. Availability of green open spaces/sports facilities [6, 9-10]	The availability of green open spaces/sports facilities affects my health condition
	I4. Availability and sanitation conditions [10]	The availability and sanitation conditions affect my health condition
	I5. Availability and quality of clean water [6, 10]	The availability and quality of clean water affects my health condition
	I6. Availability of public transportation [6, 9-10, 13]	The availability of public transportation affects my health condition

Table 1. Determining variables to build a model (cont.).

Determinants	Variables	Statements on the Questionnaires
	I7. Availability of Pedestrian Facilities [9]	The availability of pedestrian facilities affects my health condition
	I8. Availability of Health Facilities [6, 9-10]	The availability of health facilities affects my health condition
	I9. Conditions of Place of Activity [9, 14]	The conditions of place of activity (school/office/shopping center) affects my health condition
Economic (Independent)	E1. Employment [6, 10]	The occupation (including work load) affects my health condition
	E2. Income [6, 10]	The income affects my health condition
	E3. Health Fund Allocation [15]	The amount of health fund allocation affects my health condition
Social (Independent)	S1. Lifestyle [6, 16-17]	The lifestyle (including exercise and consumption) affects my health condition
	S2. Social Network [10]	The social network (friends/neighbors/family) affects my health condition
	S3. Education Level [6-10]	The education level affects my health condition
Health Condition (Dependent)	Y1. Physical Health [6, 8]	My physical health is in good condition
	Y2. Mental Health [13, 15-16]	My mental health is in good condition

The respondents consisted of individuals between the ages of 15 and 64 who were residents of Jakarta Province and actively engaged in various activities within the region. The sampling technique used is simple random sampling [18]. The sample size was determined using the Slovin formula ($n = N / (1 + Ne^2)$) [19], with an error rate of 5.6%. The study included a total of 317 respondents (Table 2). The distribution of respondents is shown on Figure 1.

Table 2. Data sampling.

Administrative Area of Jakarta Province	Number of Residents (Ages 15-64) [20]	Percentage	Number of Respondents
South Jakarta	1.792.484	21,73	69
East Jakarta	2.251.875	27,30	87
Center Jakarta	724.551	8,78	28
West Jakarta	2.054.557	24,91	79
North Jakarta	1.424.821	17,27	55
Total	8.248.288	100	317

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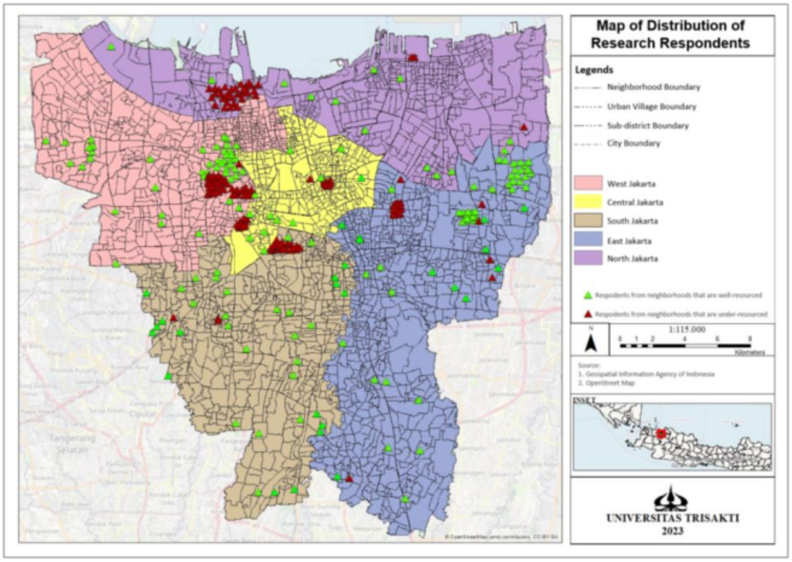

Figure 1. Map of distribution of research respondents.

The respondent profile showed that 19% of the respondents had contracted Covid-19, while 32% had contracted other communicable diseases, such as tuberculosis, malaria/dengue fever, and diarrhea during the pandemic. On the other hand, 49% reported they had not contracted any communicable diseases, and 26% confirmed they experienced stress/anxiety/depression during the pandemic.

2.2. *Data analysis*

This study employed the Partial Least Square (PLS) path modeling method, which served as an initial step in building theories through tests and validation of exploratory models [21]. The analysis was conducted using smartPLS, a widely-used tool for PLS path modeling. PLS offers an advantage in generating more accurate predictions, specifically when the sample size is relatively small [21]. The following were considered during the PLS path modeling analysis [21]:

1. Input of data and drawing of path models
2. Measurement model assessment
   a. Test validity: (a). Convergent validity: this is achieved when loading factors on the scale range from 0.5 to 0.6, indicating suitability for testing [22], and the Average Variance Extracted (AVE) should exceed 0.5 [22-23]; (b). Discriminant validity: assessed using the Fornell Larcker Criterion, where the square root of the AVE should be greater than the correlation value between latent variables, and cross-loading should be considered.
   b. Reliability test. A construct is deemed reliable when it possesses a composite reliability value exceeding 0.70 [21] and a Cronbach's alpha coefficient greater than 0.6 [24]. These assessments confirm the reliability of the findings.
3. Structural assessment of the model
   Inner Model Test: examining the R-square (percentage of indicators successfully described by the model), Path Coefficients (direction of positive or negative relationships), T-Statistics (Bootstrapping), Predictive Relevance (where blindfolding above 0 indicates the model is relevant for predicting factors), and Model Fit (model quality).
4. Forming equations based on models.

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3. Results and Discussions

To determine the model's representation, several alternative model images were tested. The model can be further analyzed using Figure 2a, based on the results of the outer loading test.

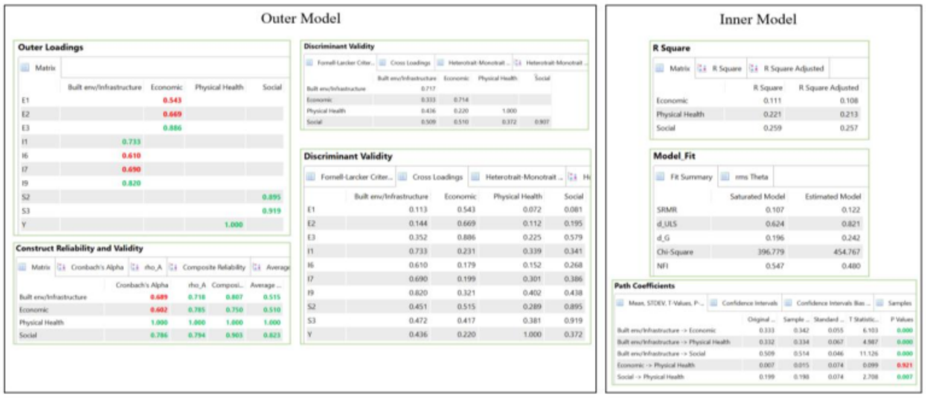
Figure 2. Alternative path models.

3.1. The relationship between urban health determinants and physical health of Jakarta residents

3.1.1. Measurement of the outer model and inner model

This model met the outer model assumption, enabling subsequent analysis, while the reliability was confirmed by the test outcomes. The structural model underwent evaluation through the R-square value for the dependent variable and path coefficient values for the independent variables. Subsequently, it was scrutinized for significance based on the t-statistical value for each path. The R-square value signifies the determination coefficient for the endogenous construct, typically indicating strength at 0.67, moderate influence at 0.33, and weak influence at 0.19. The adjusted coefficient of determination (R-square adjusted) indicated the extent of influence the independent variable exerted on the dependent variable.

1. The adjusted R-square value of 0.213 revealed that the combined influence of the independent variable (built environment/infrastructure) and the mediation variable explained 21.3 percent of the dependent variable (physical health condition). The remaining variability was attributed to factors beyond the scope of the model. The relationship between urban health determinants and physical health condition was considered moderately weak.
2. With an adjusted R-square value of 0.108, it was evident that the independent variable (built environment/infrastructure) contributed to 10.8 percent of the mediating variable represented by economic determinants. The remainder was accounted for by variables not encompassed within the model.
3. An adjusted R-square value of 0.257 indicated that the independent variable (built environment/infrastructure) elucidated 25.7 percent of the mediating variable pertaining to social determinants. The remaining variance was attributed to external factors not considered in the model.
4. An NFI value of 0.480 was obtained, indicating a 48.0% fit for the model in this study (Figure 3).



Outer Model

Outer Loadings

	Built env/Infrastructure	Economic	Physical Health	Social
E1		0.543		
E2		0.669		
E3		0.886		
I1	0.733			
I6	0.610			
I7	0.690			
I9	0.820			
S2				0.895
S3				0.919
Y			1.000	

Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composi...	Average ...
Built env/Infrastructure	0.689	0.718	0.807	0.515
Economic	0.602	0.785	0.750	0.510
Physical Health	1.000	1.000	1.000	1.000
Social	0.786	0.794	0.903	0.823

Discriminant Validity (Fornell-Larcker Criter...)

	Built env/Infrastructure	Economic	Physical Health	Social
Built env/Infrastructure	0.717			
Economic	0.333	0.714		
Physical Health	0.436	0.220	1.000	
Social	0.509	0.510	0.372	0.907

Discriminant Validity (Cross Loadings)

	Built env/Infrastructure	Economic	Physical Health	Social
E1	0.113	0.543	0.072	0.081
E2	0.144	0.669	0.112	0.195
E3	0.352	0.886	0.225	0.579
I1	0.733	0.231	0.339	0.341
I6	0.610	0.179	0.152	0.268
I7	0.690	0.199	0.301	0.386
I9	0.820	0.321	0.402	0.438
S2	0.451	0.515	0.289	0.895
S3	0.472	0.417	0.381	0.919
Y	0.436	0.220	1.000	0.372

Inner Model

R Square

	R Square	R Square Adjusted
Economic	0.111	0.108
Physical Health	0.221	0.213
Social	0.259	0.257

Model_Fit

	Saturated Model	Estimated Model
SRMR	0.107	0.122
d_ULS	0.624	0.821
d_G	0.196	0.242
Chi-Square	396.779	454.767
NFI	0.547	0.480

Path Coefficients

	Original ...	Sample ...	Standard ...	T Statistic...	P Values
Built env/Infrastructure -> Economic	0.333	0.342	0.055	6.103	0.000
Built env/Infrastructure -> Physical Health	0.332	0.334	0.067	4.987	0.000
Built env/Infrastructure -> Social	0.509	0.514	0.046	11.126	0.000
Economic -> Physical Health	0.007	0.015	0.074	0.099	0.921
Social -> Physical Health	0.199	0.198	0.074	2.708	0.007

Figure 3. Outer and inner model results.

3.1.2. Generated model of factors influencing physical health of Jakarta residents

Based on the model (Figure 4), the resulting equation is:

Y = 0.332 Built environment/Infrastructure + 0.199 Social + 0.007 Economic
Social = 0.509 Built environment/Infrastructure
Economic = 0.333 Built environment/Infrastructure

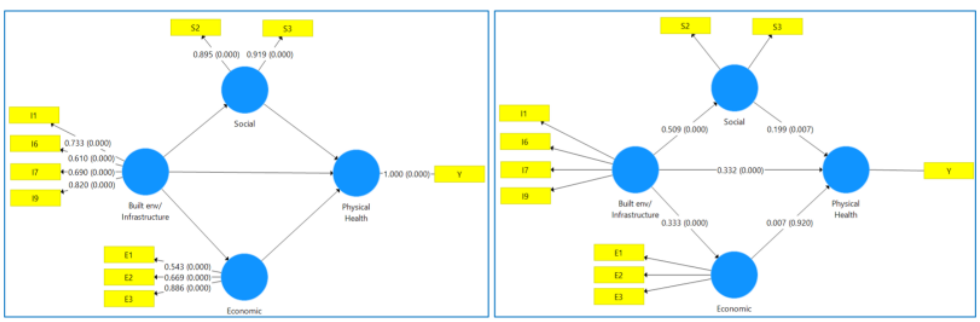


Figure 4. Generated model of factors influencing physical health of Jakarta residents.

Based on the outer and the inner model tests, the built environment/infrastructure determinant consists of Housing Condition (I1), Availability of Public Transportation (I6), Availability of Pedestrian Facilities (I7) and Conditions of Place of Activity (I9). The economic determinant includes Employment (E1), Income (E2), and Health Fund Allocation (E3) variables, while the selected variables for the social determinant are Social Network (S2) and Education Level (S3). The interpretation of the regression equation above is as follows:

1. The built environment/infrastructure directly and positively affected the physical health of Jakarta residents with a coefficient of 0.332 and a p-value of 0.000 < alpha of 0.05. This indicated that a 1-point increase in the determinant improved physical health by 0.332, while other variables were held constant.
2. The social determinant directly and positively affected physical health with a coefficient of 0.199 and a p-value of 0.007 < alpha of 0.05. This indicated that a 1-point increase in the determinant improved physical health by 0.199, while other variables were held constant.

3. The economic determinant had no effect on physical health with a coefficient of 0.007 and a p-value of 0.920 > alpha of 0.05. This indicated the evidence was not enough to conclude that an increase in economic determinants improved the physical health of Jakarta residents.

3.1.3. Multi-group analysis between neighborhoods that are well-resourced and under-resourced
Multi Group Analysis (MGA) is used when research experts have categorical/dummy variables to differentiate between existing models. In the case of the mediation model mentioned above, experts were interested in examining how the relationship between variables affected the dummy variables of neighborhoods (well-resourced and under-resourced). The objective was to identify the potential differences in the influence of settlement categories on Health, as mediated by economic and social determinants. When examining the impact based on settlement categories, it becomes evident that the impact between neighborhoods that are well-resourced and under-resourced is significantly different.

The MGA results showed that the influence of built environment/infrastructure determinants on physical health was significant for both neighborhoods that are well-resourced and under-resourced (Figure 5). This implied that the provision of infrastructure was essential for improving the health condition of Jakarta residents. The influence of social determinant on physical health was significant for the neighborhoods that are well-resourced. The direct impact of social determinant on physical health between both neighborhoods was statistically proven to be different. This result holds significant importance in this study. On the other hand, the specific indirect effects between built environment, social and physical health were significant. This section serves as a note for urban planners and stakeholders, emphasizing the need to tailor the provision and maintenance of infrastructure to the specific needs of residents in both neighborhoods.

Path Coefficients

PLS-MGA | Parametric Test | Welch-Satterthw... | Confidence Inte... | Bootstrapping R... | Copy to Clipboard: | Excel Format | R Format

	Path Coef...	Path Coef...	Path Coef...	Path Coef...	STDEV...	STDEV ...	t-Value (...	t-Value (...	p-Value(well)	p-Value (under)
Built env/Infrastructure -> Economic	0.396	0.233	0.405	0.266	0.061	0.117	6.535	1.985	0.000	0.048
Built env/Infrastructure -> Physical ...	0.274	0.424	0.278	0.423	0.083	0.098	3.308	4.306	0.001	0.000
Built env/Infrastructure -> Social	0.568	0.385	0.572	0.405	0.048	0.096	11.848	3.992	0.000	0.000
Economic -> Physical Health	-0.023	0.046	-0.015	0.060	0.091	0.127	0.256	0.366	0.798	0.714
Social -> Physical Health	0.309	0.026	0.306	0.032	0.088	0.108	3.494	0.241	0.001	0.810

Path Coefficients

PLS-MGA | Parametric Test | Welch-Satterthw... | Confidence Inte... | Bootstrapping R... | Copy to Clipboard: | Excel Format | R For

	Path Coefficients-diff (well vs under)	p-Value original 1-tailed...	p-Value new (well vs under)
Built env/Infrastructure -> Economic	0.163	0.072	0.144
Built env/Infrastructure -> Physical Health	-0.149	0.877	0.246
Built env/Infrastructure -> Social	0.183	0.039	0.079
Economic -> Physical Health	-0.070	0.679	0.642
Social -> Physical Health	0.283	0.024	0.048

Specific Indirect Effects

PLS-MGA | Parametric Test | Welch-Satterthw... | Confidence Inte... | Bootstrapping R... | Copy to Clipboard: | Excel Form

	Specific Indirect Effect...	p-Value original ...	p-Value new (well vs under)
Built env/Infrastructure -> Economic -> Physical Health	-0.020	0.652	0.697
Built env/Infrastructure -> Social -> Physical Health	0.166	0.014	0.028

Figure 5. Multi-group analysis.

3.2. The relationship between urban health determinants and mental health of Jakarta residents

3.2.1. Measurement of the outer model and inner model
This outer model successfully fulfilled the assumption based on the rule of thumb for the convergent validity (identification of loading factor and average variance extracted). The coefficient of determination (R-square adjusted) showed the extent of influence the independent variable had on the dependent variable.

1. The adjusted R-square value of 0.021 indicated that the independent variable (built environment/infrastructure) and the mediating variables could collectively account for 2.1 percent of the dependent variable (mental health condition). The remaining variance was attributed to other variables not included in the model. This signified a very weak relationship between urban health determinants and mental health outcomes.
2. An adjusted R-square value of 0.734 showed that the independent variable (built environment/infrastructure) could explain 73.4 percent of the mediating variable, which took the form of economic determinants. The remaining variance was ascribed to external variables beyond the scope of the model.
3. An adjusted R-square value of 0.613 indicated that the independent variable (built environment/infrastructure) could account for 61.3 percent of the mediating variable, represented by social determinants. The residual variance was explained by factors not considered within the model.
4. Based on the fit model, the NFI value of 0.872 indicated the model was fit at 87.2% (Figure 6).

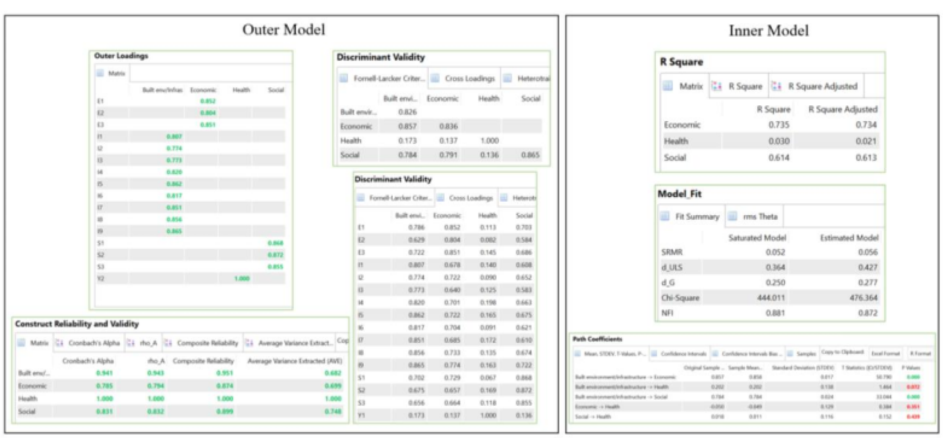


Figure 6. Outer and inner model results.

3.2.2 Generated model of factors influencing mental health of Jakarta residents

Based on the model (Figure 7), the resulting equation is:

Y = 0.202 Infrastructure + 0.018 Social - 0.05 Economic
Social = 0.784 Infrastructure
Economic = 0.857 Infrastructure

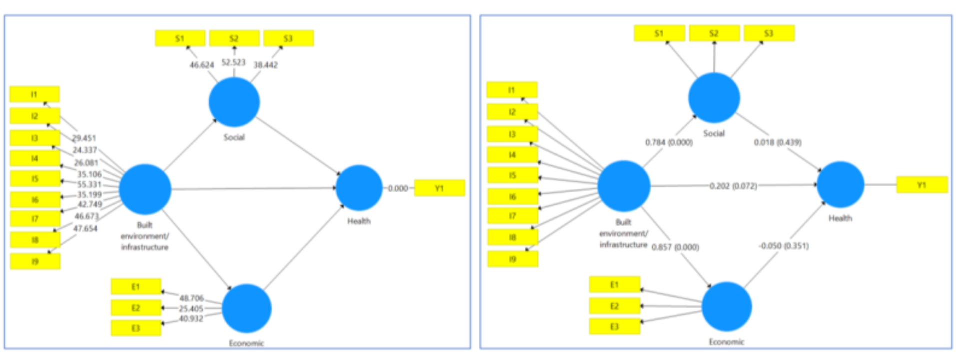


Figure 7. Generated model of factors influencing mental health of Jakarta residents.

Based on the outer and inner model tests, all variables from the built environment/infrastructure, social and economic determinants were included. The interpretation of the regression equation above is as follows:

1. The built environment/infrastructure determinant had no effect on the mental health of Jakarta residents with a coefficient of 0.202 and a p-value of 0.072 > alpha of 0.05. This indicated there was no enough evidence to prove that the increase in built environment/infrastructure improved mental health.
2. The social determinant had no effect on mental health with a coefficient of 0.018 and a p-value of 0.439 > alpha of 0.05. This indicated there was no enough evidence to prove that an increase in social determinant improved mental health.
3. The economic determinant had no effect on mental health with a coefficient of -0.050 and a p-value is 0.351 > alpha of 0.05. This indicated there was no enough evidence to prove that an increase in economic determinant improved mental health condition.

3.2.3. Multi-group analysis between neighborhoods that are well-resourced and under-resourced

The results showed that the influence of built environment/infrastructure determinant on the economic and social determinants were significant for both neighborhoods that are well-resourced and under-resourced (Figure 8). This indicated that the provision of infrastructure was crucial for improving the economic and social conditions of the community. On the other hand, the influence of infrastructure determinants on mental health was significant for the neighborhoods that are well-resourced. The direct impact of infrastructure determinants on mental health between both neighborhoods had been statistically proven to be significantly different. This result holds a significant importance in this study. However, the specific indirect effects of economic and social determinants were insignificantly different.

Path Coefficients

PLS-MGA | Parametric Test | Welch-Satterthw... | Confidence Inte... | Bootstrapping R... | Copy to Clipboard: | Excel Format | R Format

	Path Coef...	Path Coef...	Path Coe...	Path Coe...	STDEV (n...	STDEV (...	t-Value ...	t-Value ...	p-Value (well)	p-Value (under)
Built env/Infras -> Economic	0.853	0.819	0.853	0.822	0.021	0.039	41.161	21.086	0.000	0.000
Built env/Infras -> Health	0.367	-0.148	0.366	-0.128	0.166	0.190	2.213	0.779	0.027	0.436
Built env/Infras -> Social	0.768	0.728	0.769	0.730	0.033	0.059	23.568	12.278	0.000	0.000
Economic -> Health	-0.117	0.207	-0.120	0.196	0.146	0.198	0.803	1.046	0.422	0.296
Social -> Health	0.040	0.013	0.037	-0.003	0.139	0.158	0.285	0.084	0.776	0.933

Path Coefficients

PLS-MGA | Parametric Test | Welch-Satterthw... | Confidence Inte... | Bootstrapping R... | Copy to Clipboard: | Excel Format | R Format

	Path Coefficients-diff (well vs under)	p-Value original 1-tailed (well vs under)	p-Value new (well vs under)
Built env/Infras -> Economic	0.034	0.229	0.458
Built env/Infras -> Health	0.515	0.024	0.047
Built env/Infras -> Social	0.041	0.281	0.563
Economic -> Health	-0.324	0.905	0.189
Social -> Health	0.026	0.461	0.922

Specific Indirect Effects

PLS-MGA | Parametric Test | Welch-Satterthw... | Confidence Inte... | Bootstrapping R... | Copy to Clipboard: | Excel Format | R Format

	Specific Ind...	Specific Ind...	Specific ...	Specific ...	STDE...	STDEV...	t-Value...	t-Valu...	p-Value (well)	p-Value (under)
Built env/Infras -> Social -> Health	0.030	0.010	0.028	-0.004	0.107	0.119	0.286	0.081	0.775	0.935
Built env/Infras -> Economic -> Health	-0.100	0.170	-0.102	0.162	0.125	0.164	0.802	1.032	0.423	0.302

Figure 8. Multi-group analysis.

3.3. Discusssions

Urban resources, including features of the built environment, social environment, as well as economic are considered determinants that can influence justice in realizing the goals of urban health [25]. Previous studies have primarily focused on examining the statistical relationship of variables in one to two determinants of health outcomes in general or within a specific scope of health outcomes (communicable disease, non-communicable disease, or mental illness) [6, 8, 13, 15-16]. Nonetheless, this study delves into the interplay among three health determinants, such as the built environment/infrastructure, social determinants, and economic determinants, with a focus on the physical and mental well-being of Jakarta residents amid the Covid-19 pandemic. The findings from both models unveiled a moderately weak connection between urban health determinants and physical health. However, the link between urban health determinants and mental health appeared to be statistically insignificant. This lack of significance may be attributed to the intricate and diverse nature of cities, where numerous factors can impact the overall health of the population. Evaluating how the urban environment influences health presented challenges and introduced complexities that cannot be easily resolved through the application of straightforward analytical methods [8]. Additionally, cities are dynamic and undergo transformations, with the Covid-19 outbreak serving as a disruptive force in urban areas. This phenomenon had implications for the varying contributions of different factors in shaping health within cities [8]. The built environment/infrastructure emerged as the most influential determinant of the physical health of Jakarta residents. This conclusion was in line with previous studies, highlighting the impact of housing conditions [6, 10], availability of public transportation [6,9-10,13], availability of pedestrian facilities [9], and conditions of place of activity [9,14] on urban health. The Covid-19 pandemic offers an opportunity to test and implement built environment and infrastructure interventions aimed at increasing health equity and decreasing health risks [26].

4. Conclusion

The outer model assumption was fulfilled, indicating the validity of the two models employed. Based on the inner model analysis, the direct influence of the urban health determinants on urban health was moderately weak (21.3%). The two determinants of urban health, namely the built environment/ infrastructure and social determinant, significantly and positively affected the physical health of the residents. The resulting equation is as follows: Y = 0.332 Built environment/Infrastructure + 0.199 Social + 0.007 Economic. Each increase in social determinant was influenced by 0.509 of the built environment/infrastructure determinants, while each increase in economic determinant was influenced by 0.333 of the built environment/infrastructure determinants. The built environment/infrastructure, represented by housing condition (I1), availability of public transportation (I6), availability of pedestrian facilities (I7), and conditions of place of activity (I9) variables, exhibited a greater influence on physical health than others. The social determinant, which is represented by variables of social network (S2) and education level (S3) also significant and positively affects the physical health of Jakarta residents. The impact of built environment/infrastructure determinant on physical health was significant for both neighborhoods that are well-resourced and under-resourced, while the influence of social determinant on physical health was significant only for the neighborhoods that are well-resourced. Regarding the inner model, the direct influence of urban health determinants on mental health was found to be very weak (2.1%), and none of the determinants significantly affected the mental health of Jakarta residents. The MGA result revealed that the influence of built environment/infrastructure determinant on economic and social outcomes was significant for both neighborhoods. Moreover, the influence of this determinant on mental health was significant only for the neighborhoods that are well-resourced. This study statistically proved that the direct influence of built environment/infrastructure determinant on mental health significantly differed between neighborhoods that are well-resourced and under-resourced.

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